World Inventia Publishers

Journal of Scientific Research in Pharmacy

http://www.jsrponline.com/

Vol. 8, Issue 2, 2019 ISSN: 2277-9469 USA CODEN: JSRPCJ

Review Article

CORTICOSTEROID INDUCED PSYCHIATRIC DISORDERS

Vijayalakshmi R [1]*, Sujitha P.J [2]

*[1] Pharm D Intern, J.K.K. Nattraja College of Pharmacy, Kumarapalayam, Erode, Tamil Nadu, INDIA.

[2] Department of Pharmacy Practice, J.K.K. Nattraja College of Pharmacy, Kumarapalayam, Erode, Tamil Nadu, INDIA.

Received on: 29-01-2019; Revised and Accepted on: 27-02-2019

ABSTRACT

Corticosteroids are widely used for its anti-inflammatory and immunosuppressant properties. It can be given by systemic, oral or inhalation. Corticosteroids are associated with a wide range of adverse events which include diabetes, osteoporosis, glaucoma and psychiatric mood swings. Mood swings can be observed within first two weeks, but discontinuation of drug can reverse this. Psychiatric disorders with prescription corticosteroids are classified as substance-induced mood disorders according to DSM-IV criteria. Mania is more commonly found than depression, but depression is triggered by steroid withdrawal. All these psychiatric symptoms are reversible and disappear with the discontinuation of drug.

KEYWORDS: *Corticosteroid, Mood Swings, Depression.*

INTRODUCTION

Corticosteroids are a collection of steroid hormones produced within the adrenal cortex or made synthetically. They are of two categories: glucocorticoids which suppress inflammation and immunity and assist in the breakdown of fat, carbohydrates, and proteins, or as mineralocorticoids (salt-retaining) that regulate the salt and water stability within the body.

"Anabolic" refers to muscle building, and "androgenic" refers to elevated male sex traits. They are variations of testosterone. Anabolic steroid abuse can also cause mental problems like paranoid jealousy, severe irritability, delusions, and impaired judgment [1].

The outer portion of adrenal gland referred to as cortex produces naturally occurring corticosteroids, hydrocortisone (Cortef) and cortisone. Synthetic corticosteroids mimic the actions of naturally occurring corticosteroids and can be used to update corticosteroids in people with adrenal glands that are unable to provide adequate amounts of corticosteroids, they include betamethasone (Celestone), prednisone (Prednisone Intensol), prednisolone (Orapred, Prelone), triamcinolone (Aristospan Intra-Articular, Aristospan Intralesional, Kenalog), methylprednisolone (Medrol, Depo-Medrol, Solu-Medrol) and dexamethasone [2].

Glucocorticoids are capable to suppress inflammation and acts in different varieties of anti-inflammatory and autoimmune diseases makes them among the most often prescribed classes of medicine [3].

Glucocorticoids have turn out to be essential in almost every subspecialty of medicine. Symptoms for short-term acute steroid therapy can be seen in exacerbation of the chronic obstructive pulmonary disease, acute gout, chemotherapy protocols, bacterial meningitis and in pregnant women for fetal lung maturation, to name some. Disease processes benefiting from persistent glucocorticoid use consist of the following: pulmonary diseases such as idiopathic interstitial pneumonia, hypersensitivity pneumonitis and sarcoidosis; autoimmune conditions; neurologic diseases such as myasthenia gravis and multiple sclerosis; and inflammatory bowel diseases (IBS) [4].

Short-term corticosteroid use is associated with generally mild side effects, consisting of cutaneous effects, electrolyte abnormalities, hypertension, hyperglycemia, pancreatitis, hematologic, immunologic, and neuropsychological effects, although occasionally, clinically significant side effects may occur. Long-term corticosteroid use can be associated with the more serious sequel, which includes osteoporosis, aseptic joint necrosis, adrenal insufficiency, gastrointestinal, hepatic, and ophthalmologic effects, hyperlipidemia, growth suppression, and possibly congenital malformations [4].

Common corticosteroids induced psychiatric disorders (CIPD) include mania, depression, psychosis, and delirium. The females and people with prior CIPD are at elevated risk. Depression and mania are the most frequent behavioral side

***Corresponding author:**

Vijayalakshmi R

Pharm D Intern,

J.K.K. Nattraja College of Pharmacy,

Kumarapalayam, Erode, Tamil Nadu, INDIA.

** E-Mail: tryphenea@gmail.com*

DOI:

effects, accompanied by psychosis and delirium. There may be different etiologies for these psychiatric disorders; they need to be nicely distinguished from corticosteroid facet results [5].

Case reports of psychiatric side effects which include mania, depression, mood liability, or even psychosis during corticosteroid therapy are numerous (table 1). They may be prescribed at physiological doses for replacement therapy when endogenous production is impaired.

Table No. 1: Studies on CIPD.

Study	Indication	Symptom	Drug
Laurence Fardet	Miscellaneous	suicide or suicide attempt,severe neuropsychiatric disorders	oral glucocorticoids
Tutkunkardas and Mukaddes (2010)	T-ALL	Mood lability, irritability, anger outburst, suicidal ideation	Dexamethasone
Ularntinon et al. (2010)	T-cell ALL/Pre-B-cell ALL	Elation, grandiose ideation, prophetic delusion, insomnia,Agitation, irritability,pressured	Prednisone/ Dexamethasone
Airagnes et al. (2011)	CLL	Insomnia, elation, paranoid psychosis, homicide	Methylprednisolone
Cassidy et al. (2012)	ALL	Insomnia, elation, grandiose delusion	Dexamethasone
Kimmel and Combs (2012)	Metastatic breast cancer D	Agitation, insomnia, irritability, thought disorder	Dexamethasone
Hechtman et al. (2013)	ALL	Agitation, auditory and visual hallucination, pressured speech	Prednisone
Zincir et al. (2014)	ALL	Depressive symptoms, lost appetite, passive death wish and suicide attempt	Dexamethasone

Corticosteroid and Psychiatric Disorders:

Corticosteroid has been related to a wide range of psychiatric symptoms since their introduction in 1950's4. These are all reported to be reversible. Those include mood disorders (hypomania, mania, mixed states, depression), anxiety and panic disorder [6-7], delirium, suicidal thinking and behavior in the context of affective syndromes or delirium, aggressive behavior, insomnia, dementia and agitation with clear consciousness, depersonalization; and, isolated cognitive impairments [8-9].

Glucocorticoids are extensively prescribed for a variety of skin diseases and are known to cause a variety of neuropsychiatric as well as somatic side effects. The incidence of neuropsychiatric results of steroids vary from 2% to 60% [10].

Corticosteroids are widely used in asthma, COPD and respiratory illness. Gift et al has suggested an elevated degree of depression in a collection of COPD patients on corticosteroids [11].

According with a case-control study conducted in Texas, patients receiving chronic corticosteroid therapy have smaller hippocampal volumes, lower N-acetyl aspartate ratios, and declarative memory deficits as compared with controls. Hippocampal volume reduction, declarative memory deficits, and cortisol elevations are reported in people with major depressive disorder [12].

Higher the corticosteroid dose, higher the risk of psychiatric symptoms. In patients taking prednisone, the Boston Collaborative Drug Surveillance Project determined the incidence of psychiatric side effects to be: 1.3% in patients taking <40 mg,4.6% in those taking 41 to 80 mg and 18.4% in those taking >80 mg [13].

Olsen et al. found a significant correlation between mood lability and prednisolone dose, in 25% of patients during a 6-week taper from 40 mg/day to zero in 32 patients with alopecia areata14. Studies conclude that out of 16 patients with first-onset mood symptoms after corticosteroid use, a retrospective chart review determined 7 had recurrent manic and depressive symptoms unrelated to additional corticosteroid use15. These suggest that corticosteroid use may contribute to the onset of bipolar I illness [14-18].

Hall et al. reported that 86% of patients with psychiatric side-effects developed within 1 week of starting treatment [19]. While Ling et al. suggested that the psychiatric sequelae of corticosteroid treatment generally occurred within 2 weeks [17].

Cognitive impairment has been reported in systemic corticosteroid use. Varney et al have reported in a case series of 6 patients taking prednisolone 20 to 100 mg daily, that they developed cognitive problems. These included functional deficits, attention issues, concentration, and verbal memory.[20] All these were reversible. There have also been reports suggesting that dexamethasone can cause deficits in declarative memory. Same were reported on the high dose of hydrocortisone use however those are reversible and can be fixed by the discontinuation of drug [21-23].

According to a cross-sectional observational study conducted in eastern India, on patients attending dermatology department, receiving corticosteroids in any total topical corticosteroids prescribed, the trend revealed that high potency corticosteroids were majorly prescribed (38%), accompanied by those of ultra-high potency (35%) and medium potency (19%). The study concluded that misuse of topical corticosteroids has a huge impact on dermatological practices which needs multi-dimensional interventions, regarding educational, lawful and managerial approaches to overcome it [24].

The studies have counseled that mania is more common than depression. As reported by Wada et al, 85% of steroid-induced mood changes were primarily manic in nature [15]. This report is complementary to Naber et al., where 26% of people developed mania in comparison to 10% depression, during corticosteroid therapy [16]. Also, based on an American

study mood changes were observed even during brief courses of corticosteroids at modest dosages and these symptoms were primarily manic, not depressive. In fact, people with depression have displayed improvement [25]. However a study by Bolanos et al, unlike short-term prednisone therapy, long-term therapy can be more associated with depressive than manic symptoms [26].

Patients who did not experience psychiatric side effects with corticosteroids in the past don't mean it won't develop later. One report examined 17cases of steroid-induced psychiatric illness in patients with previous exposure to corticosteroid therapy. Six patients had previous psychiatric side effects while taking corticosteroids and 11 did not [27].

Management of CIPD:

Antidepressants and mood stabilizers are prescribed for CIPD [27]. Patients in most cases self-manage destructive consequences experienced and will have only limited information about CIPD. Education, support, and ongoing care for patients experiencing CIPD are insufficient. Health professionals need to broaden patient- and family-targeted educational sources for potential, unpredictable, and adverse steroid side-effects [28].

Lithium and phenytoin can prevent mood symptoms associated with corticosteroids based on some controlled trials whilst some uncontrolled trials recommend that antipsychotics, anti-seizure medications and perhaps some antidepressants can be beneficial in normalizing corticosteroid-related mood changes. Additionally, lamotrigine and memantine were proven to reverse, at least partially, the declarative memory effects of corticosteroids [29].

In a study carried out in cancer patients, self-management of signs blanketed, particular strategies to cope with: (i) sleeplessness, included "now not fighting it " and accepting sleep medication,(ii) heightened strength, mandatory self-rest, making "to do "lists, and spreading chores over three days in preference to two, (iii) terrible awareness, blanketed writing matters down, (iv) misery over weight gain. through controlling urge for food, (v) alcohol consumption, such as counseling,(vi) heightened aggression, by means of explaining steroid results to family and seeing a counselor, and (vii) feeling sorry for oneself by in search of assist from a psychiatry registrar. Some have been provided medicinal drugs to ameliorate steroid facet-consequences. While occasional individuals located medicinal drugs beneficial for reducing "rushing", head "humming", and sleep disturbance, others did not take them, likely due to worries about toxicity and dependency [28].

Side effects of corticosteroids in hematologic sufferers range from negligible to intense, which include paranoia, aggressiveness, marked sleep disturbance, and mental disturbance related to intense weight gain and changes in body image [28].

In a study carried out in 12 outpatients with corticosteroid-induced mood disorders the records advised that olanzapine is nicely tolerated and appears to be beneficial for mood disturbances associated with corticosteroid remedy [30]. Falk et al. pronounced that lithium pretreatment would possibly prevent corticosteroid-caused mood symptoms. While as 14% of patients receiving corticotropin therapy suffered from mood signs and symptoms, none of the patients receiving corticotrophin following lithium pretreatment had a mood disturbance [31].

Role of Clinical Pharmacist in CIPD:

Clinical pharmacist play a major role in identifying CIPD.Proper patient history interview and therapeutic monitoring can aid this. It is also the duty of clinical pharmacist to provide proper counseling to the patient as well as intervention once CIPD is identified. Prescription auditing and maintaining a daily progression chart for the patient will help in making early interventions.

REFERENCES:

1. Anabolic Steroids.National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services.Updated March **2016**.
2. https://www.medicinenet.com/corticosteroids-oral/article.html
3. Kendall EC. Nobel lecture: The development of cortisone as a therapeutic agent. Nobelprize.org. December 11 **1950**.
4. Buchman AL. Side effects of corticosteroid therapy. J Clin Gastroenterol **2001**;33(4):289-294.
5. Cerullo MA. Expect psychiatric side effects from corticosteroid use in the elderly. Geriatrics **2008**;63(1): 15-18.
6. Raskin DE. Steroid-induced panic disorder. Am J Psych **1984**;1641:1647.
7. Charbonneau Y, Ravindran AV. Successful treatment of steroid-induced panic disorder with fluvoxamine. J Psych Neurosci **1997**;22:346–347.
8. Braunig P, Bleistein J, Rao ML. Suicidality and corticosteroid-induced psychosis. Biol Psych **1989**;26: 209–210.
9. Finkenbine RD, Frye MD. Case of psychosis due to prednisone-clarithromycin interaction. Gen Hosp Psych **1998**;20:325–326.
10. Ularntinon S, Tzuang D, Dahl G, Shaw RJ. Concurrent Treatment of Steroid-Related Mood and Psychotic Symptoms with Risperidone. Pediatrics **2010**;125(5): e1241-1245.
11. Gift AG, Wood RM, Cahill CA. Depression, somatization and steroid use in chronic obstructive pulmonary disease. Int J Nurs Stud **1989**;26:281–286.
12. Brown ES, Woolston J, Frol A, Bobadilla L, Khan DA, Hanczyc M,et al. Hippocampal volume, spectroscopy, cognition, and mood in patients receiving corticosteroid therapy. Biol Psych **2004**;55(5):538–545.
13. The Boston Collaborative Drug Surveillance Program. Acute adverse reactions to prednisone in relation to dosage. Clin Pharmacol Ther **1972**;13:694-698.
14. Olsen EA, Carson SC, Turney EA. Systemic steroids with or without 2% topical minoxidil in the treatment of alopecia areata. Arch Dermatol **1992**;128(11):1467-1473.
15. Wada K, Yamada N, Sato T et al. Corticosteroid-induced psychotic and mood disorders: diagnosis defined by DSM-IV and clinical pictures. Psychosom **2001**;42(6): 461–466.
16. Naber D, Sand P, Heigl B. Psychopathological and neuropsychological effects of 8-days' corticosteroid treatment. A prospective study. Psychoneuroendocrinol **1996**;21(1):25–31.

17. Ling MH, Perry PJ, Tsuang MT. Side effects of corticosteroid therapy. Psychiatric aspects. Arch Gen Psych **1981**;38(4):471–477.
18. Narrow WE, Rae DS, Robins LN, Regier DA. Revised prevalence estimates of mental disorders in the United States: using a clinical significance criterion to reconcile 2 surveys' estimates. Arch Gen Psych **2002**;59(2):115-123.
19. Hall RC, Popkin MK, Stickney SK, Gardner ER. Presentation of the steroid psychoses. J Nerv Ment Dis **1979**;167(4):229–236.
20. Varney NR, Alexander B, MacIndoe JH. Reversible steroid dementia in patients without steroid psychosis. Am J Psych **1984**;141(3):369–372.
21. Wolkowitz OM, Rubinow D, Doran AR et al. Prednisone effects on neurochemistry and behavior. Preliminary findings. Arch Gen Psych **1990**;47(10):963–968.
22. Newcomer JW, Craft S, Hershey T, Askins K, Bardgett ME. Glucocorticoid-induced impairment in declarative memory performance in adult humans. J Neurosci **1994**;14(4):2047–2053.
23. Newcomer JW, Selke G, Melson AK, Hershey T, Craft S,Richards K, Alderson AL. Decreased memory performance in healthy humans induced by stress-level cortisol treatment. Arch Gen Psych **1999**;56(6):527–533.
24. Mukherjee, et al. Assessment of corticosteroid utilization pattern among dermatology outpatients in a tertiary care teaching hospital in Eastern India. Int J Green Pharm **2016**;10(4):S178-182.
25. Brown ES, Suppes T, Khan DA, Carmody TJ 3rd. Mood changes during prednisone bursts in outpatients with asthma. J Clin Psychopharmacol **2002**;22(1):55-61.
26. Bolanos SH, Khan DA, Hanczyc M, Bauer MS, Dhanani N, Brown ES. Assessment of mood states in patients receiving long-term corticosteroid therapy and in controls with patient-rated and clinician-rated scales. Ann Allergy Asthma Immunol **2004**;92(5):500-5.
27. Wada K, Yamada N, Suzuki K, et al. Recurrent Cases of Corticosteroid-Induced Mood Disorder: Clinical Characteristics and Treatment. J Clin Psych **2000**;61(4):261-267.
28. Clifton D, Ross M, O'Callaghan C.Psychiatric sequelae of corticosteroid use in hematology in Australia: A qualitative study. Nurs Health Sci **2018**;20(1):125–131.
29. Brown ES. Management of psychiatric side effects associated with corticosteroids. Expert Rev Neurother **2003**;3(1):69-75.
30. Brown ES, Chamberlaina W, Dhanania N, Paranjpea P, Carmodya TJ, Sargeanta M. An open-label trial of olanzapine for corticosteroid-induced mood symptoms. J Affect Disorders **2004**;83(2-3):277-281.
31. Falk WE, Mahnke MW, Poskanzer DC. Lithium prophylaxis of corticotropin-induced psychosis. JAMA **1979**;241(10):1011– 1012.

How to cite this article:

Vijayalakshmi R, Sujitha P.J. CORTICOSTEROID INDUCED PSYCHIATRIC DISORDERS. J Sci Res Pharm 2019;8(2):8-11.

Conflict of interest: The authors have declared that no conflict of interest exists.

Source of support: Nil